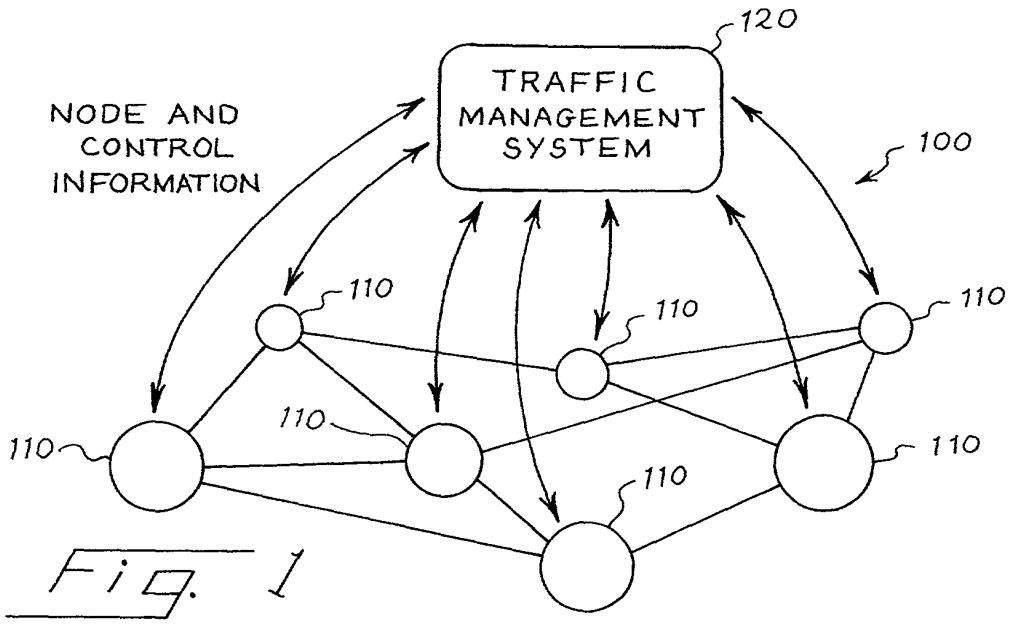

120
TRAFFIC MANAGEMENT SYSTEM
NODE AND CONTROL INFORMATION
100
110
110
110
110
110
110
110

Fig. 1

Fig. 2

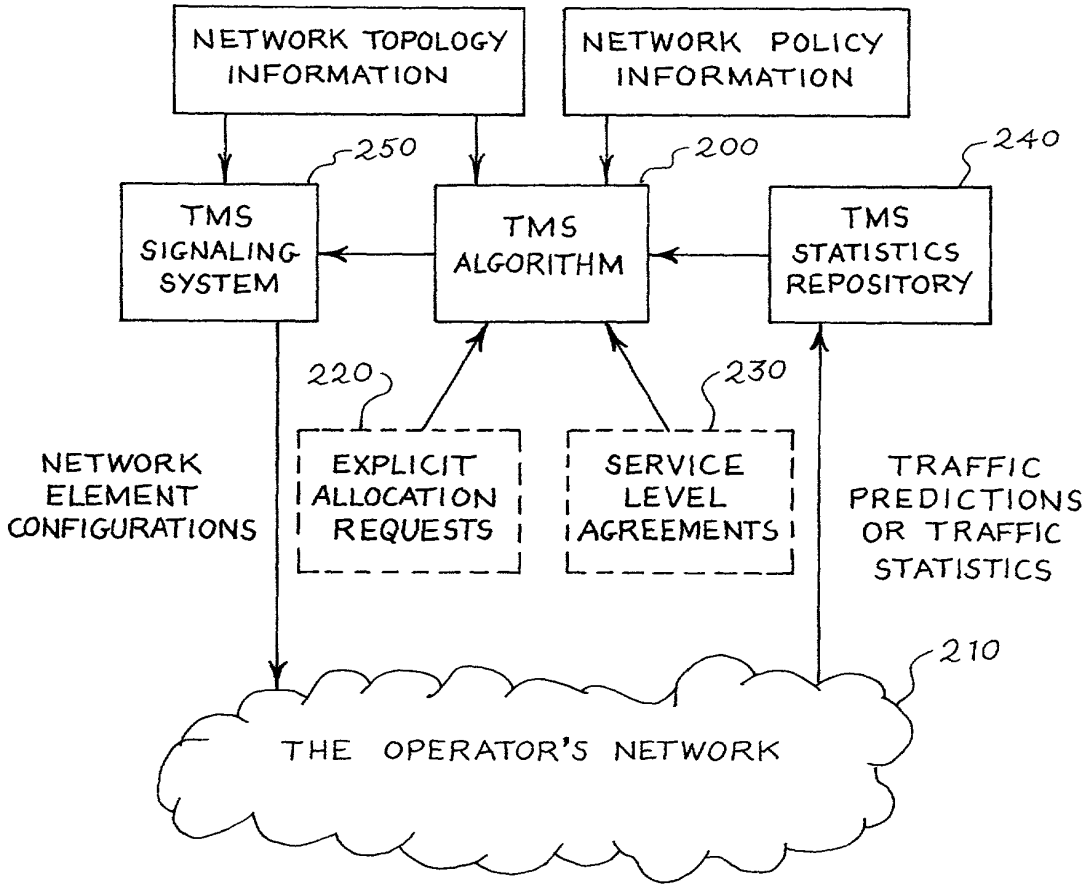
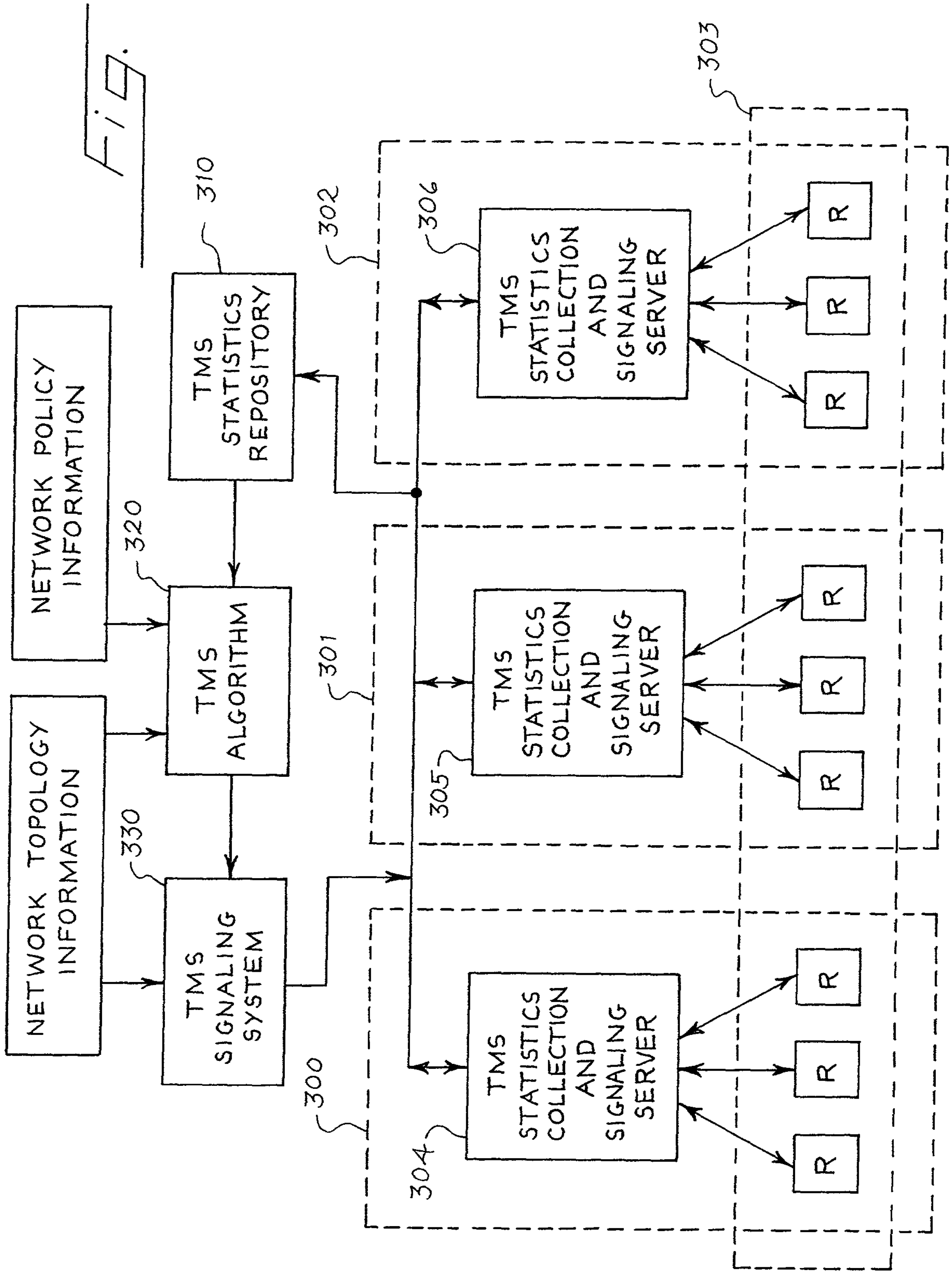

NETWORK TOPOLOGY INFORMATION
NETWORK POLICY INFORMATION
250
200
240
TMS SIGNALING SYSTEM
TMS ALGORITHM
TMS STATISTICS REPOSITORY
220
230
NETWORK ELEMENT CONFIGURATIONS
EXPLICIT ALLOCATION REQUESTS
SERVICE LEVEL AGREEMENTS
TRAFFIC PREDICTIONS OR TRAFFIC STATISTICS
210
THE OPERATOR'S NETWORK

Fig. 3


NETWORK POLICY INFORMATION
NETWORK TOPOLOGY INFORMATION
TMS STATISTICS REPOSITORY
310
TMS ALGORITHM
320
TMS SIGNALING SYSTEM
330
302
301
300
303
306
305
304
TMS STATISTICS COLLECTION AND SIGNALING SERVER
TMS STATISTICS COLLECTION AND SIGNALING SERVER
TMS STATISTICS COLLECTION AND SIGNALING SERVER
R
R
R
R
R
R
R
R
R

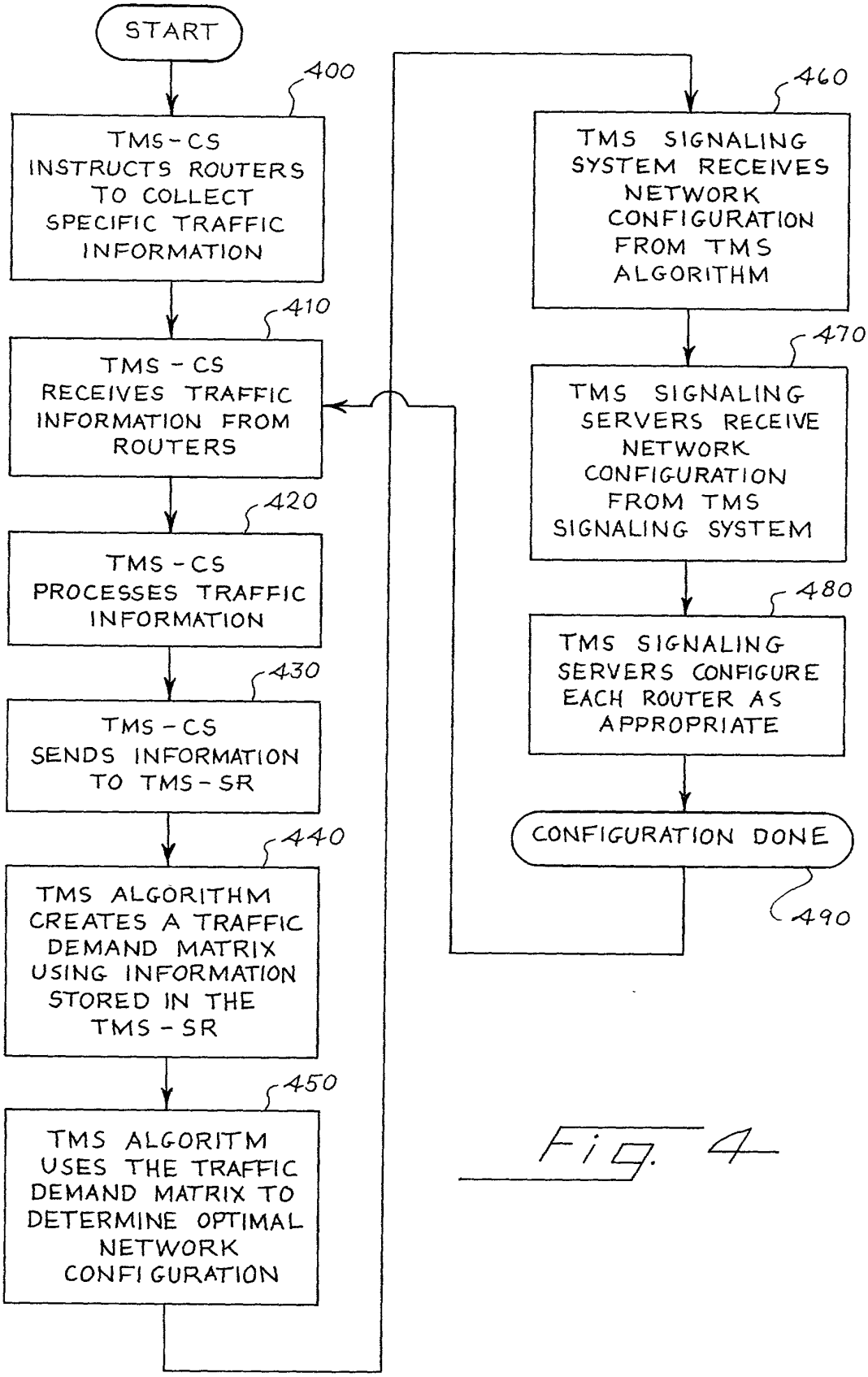

START
400
TMS-CS INSTRUCTS ROUTERS TO COLLECT SPECIFIC TRAFFIC INFORMATION
410
TMS-CS RECEIVES TRAFFIC INFORMATION FROM ROUTERS
420
TMS-CS PROCESSES TRAFFIC INFORMATION
430
TMS-CS SENDS INFORMATION TO TMS-SR
440
TMS ALGORITHM CREATES A TRAFFIC DEMAND MATRIX USING INFORMATION STORED IN THE TMS-SR
450
TMS ALGORITM USES THE TRAFFIC DEMAND MATRIX TO DETERMINE OPTIMAL NETWORK CONFIGURATION
460
TMS SIGNALING SYSTEM RECEIVES NETWORK CONFIGURATION FROM TMS ALGORITHM
470
TMS SIGNALING SERVERS RECEIVE NETWORK CONFIGURATION FROM TMS SIGNALING SYSTEM
480
TMS SIGNALING SERVERS CONFIGURE EACH ROUTER AS APPROPRIATE
CONFIGURATION DONE
490

Fig. 4

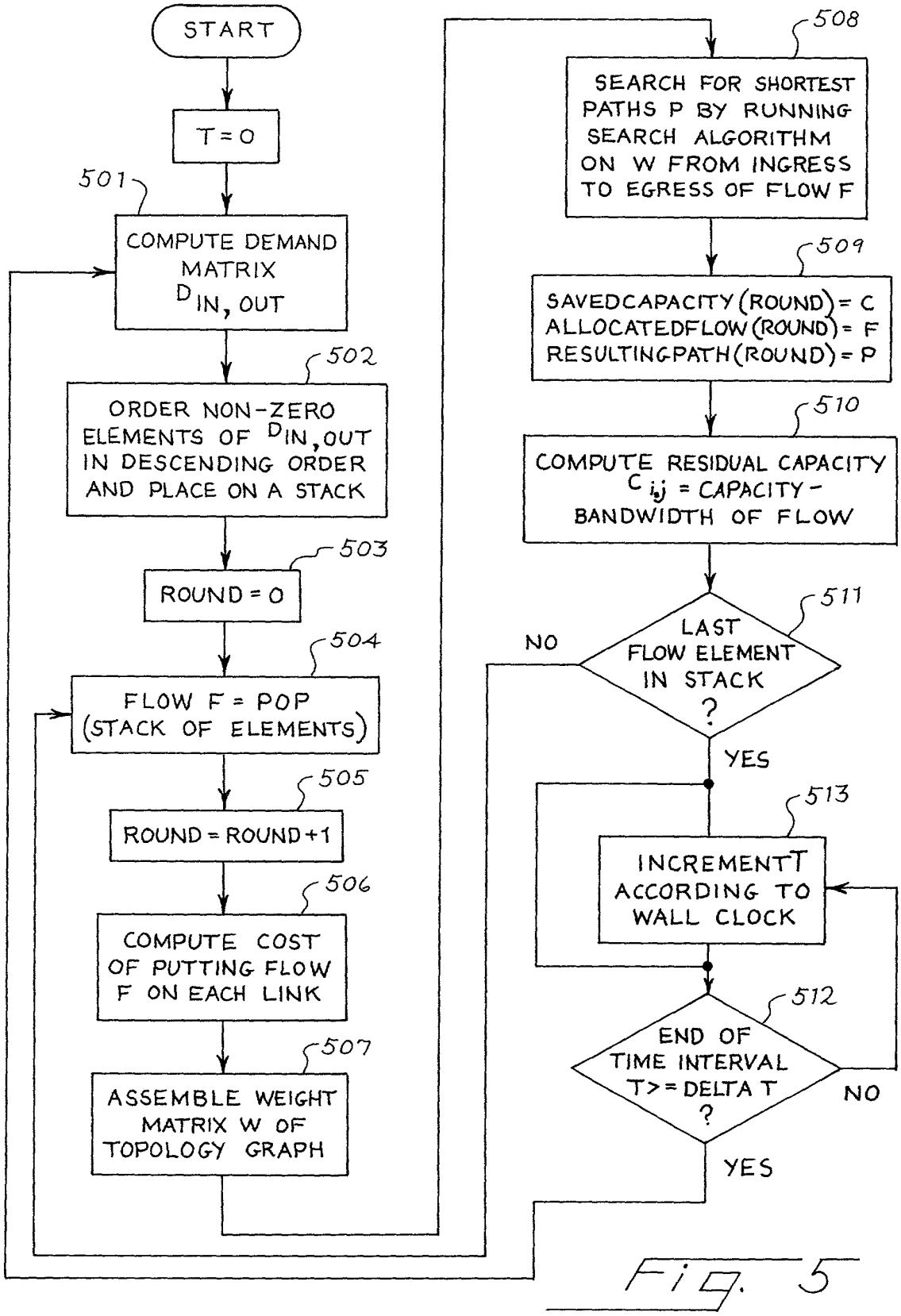

START
T = 0
501
COMPUTE DEMAND MATRIX $D_{IN, OUT}$
502
ORDER NON-ZERO ELEMENTS OF $D_{IN,OUT}$ IN DESCENDING ORDER AND PLACE ON A STACK
503
ROUND = 0
504
FLOW F = POP (STACK OF ELEMENTS)
505
ROUND = ROUND + 1
506
COMPUTE COST OF PUTTING FLOW F ON EACH LINK
507
ASSEMBLE WEIGHT MATRIX W OF TOPOLOGY GRAPH
508
SEARCH FOR SHORTEST PATHS P BY RUNNING SEARCH ALGORITHM ON W FROM INGRESS TO EGRESS OF FLOW F
509
SAVEDCAPACITY(ROUND) = C
ALLOCATEDFLOW(ROUND) = F
RESULTINGPATH(ROUND) = P
510
COMPUTE RESIDUAL CAPACITY $C_{i,j}$ = CAPACITY - BANDWIDTH OF FLOW
511
LAST FLOW ELEMENT IN STACK ?
NO
YES
513
INCREMENTT ACCORDING TO WALL CLOCK
512
END OF TIME INTERVAL T>= DELTA T ?
NO
YES

Fig. 5

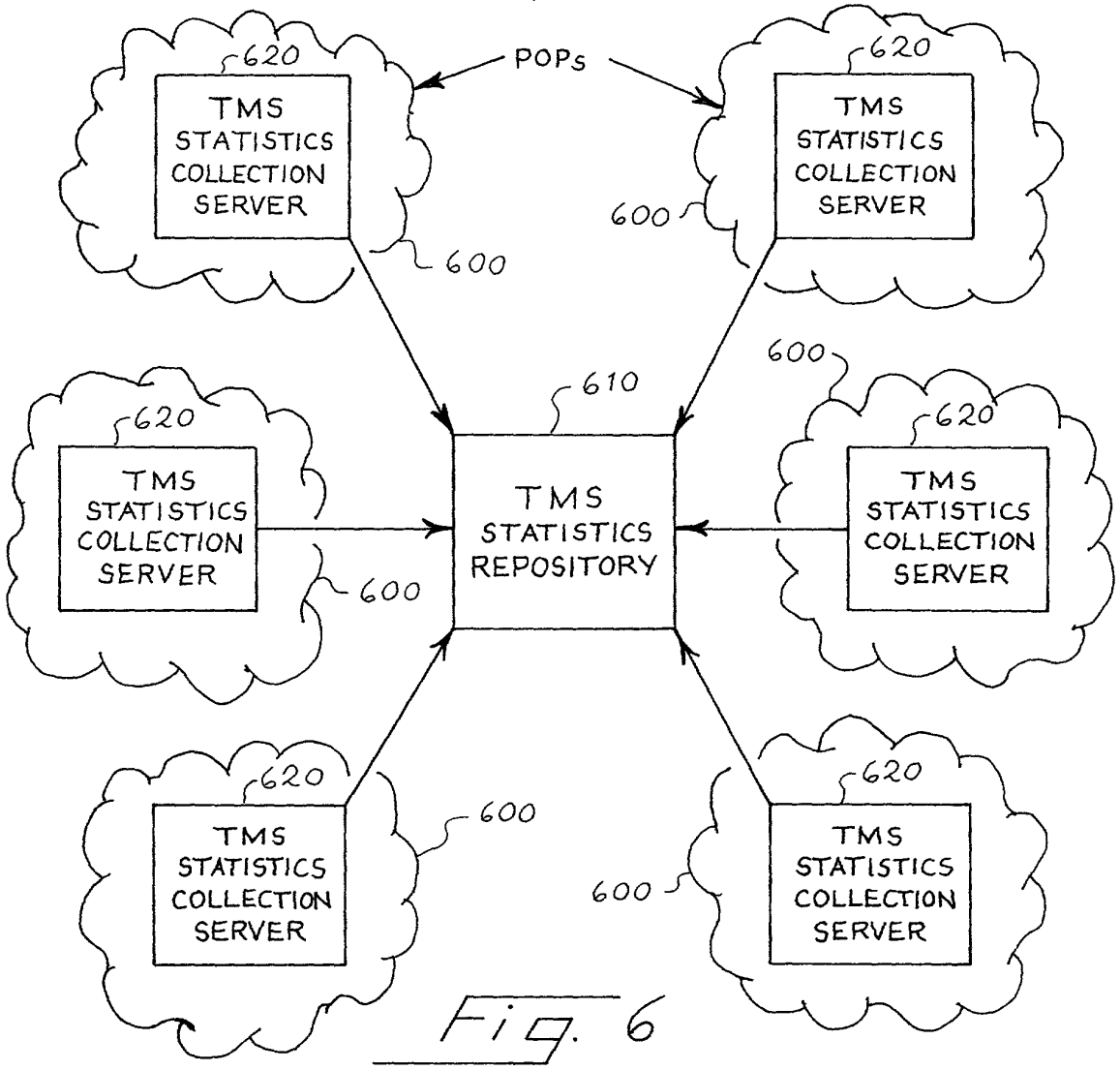
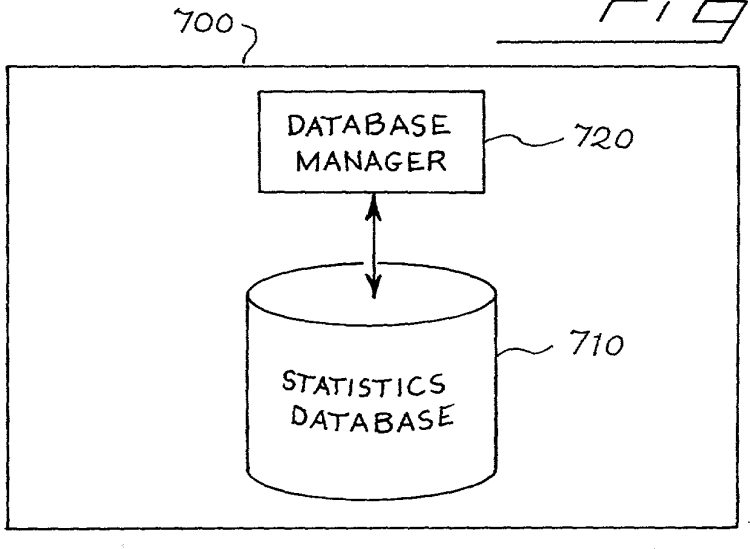


Fig. 6

Fig. 7



TMS STATISTICS REPOSITORY

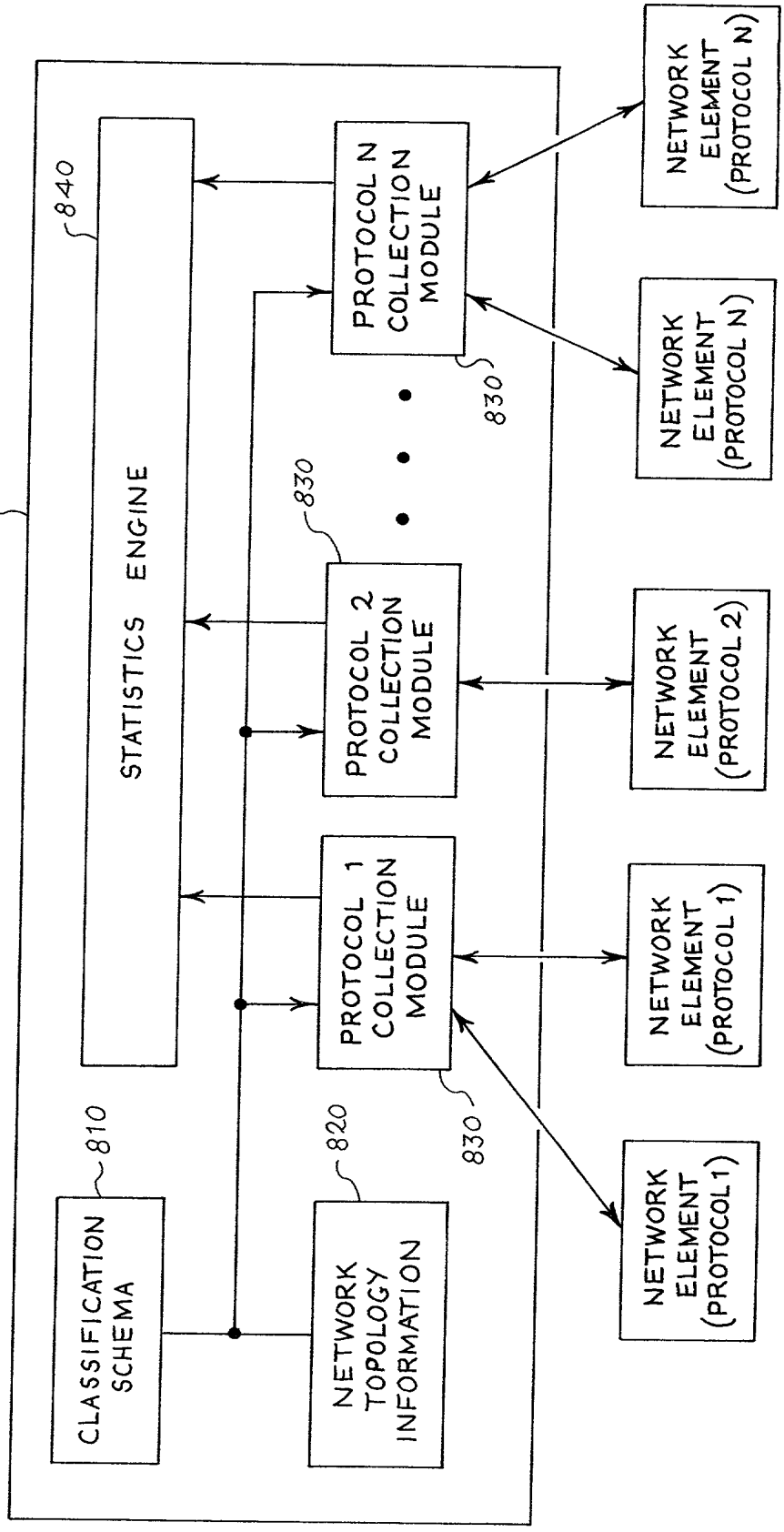


Fig. 8

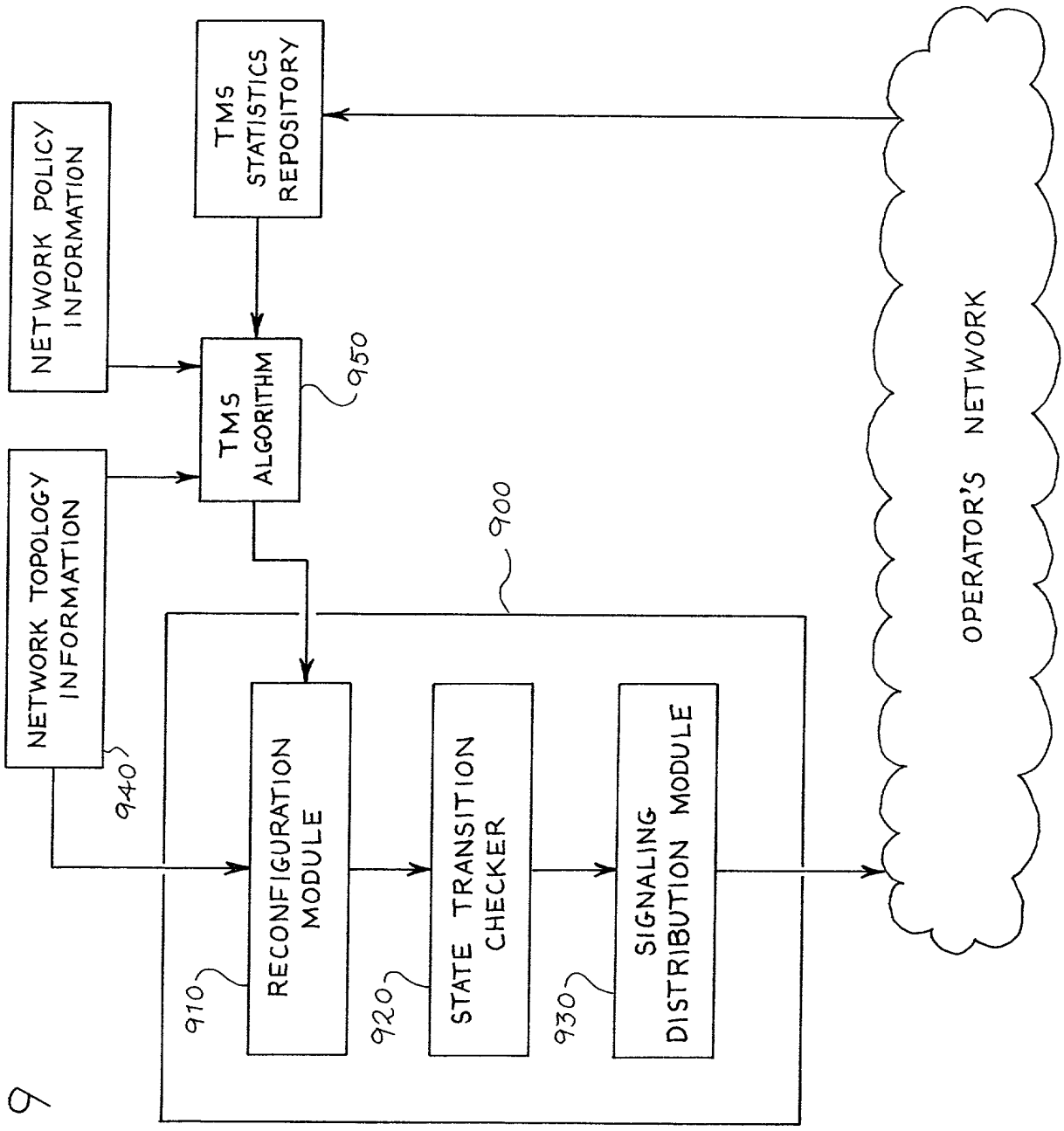


Fig. 9

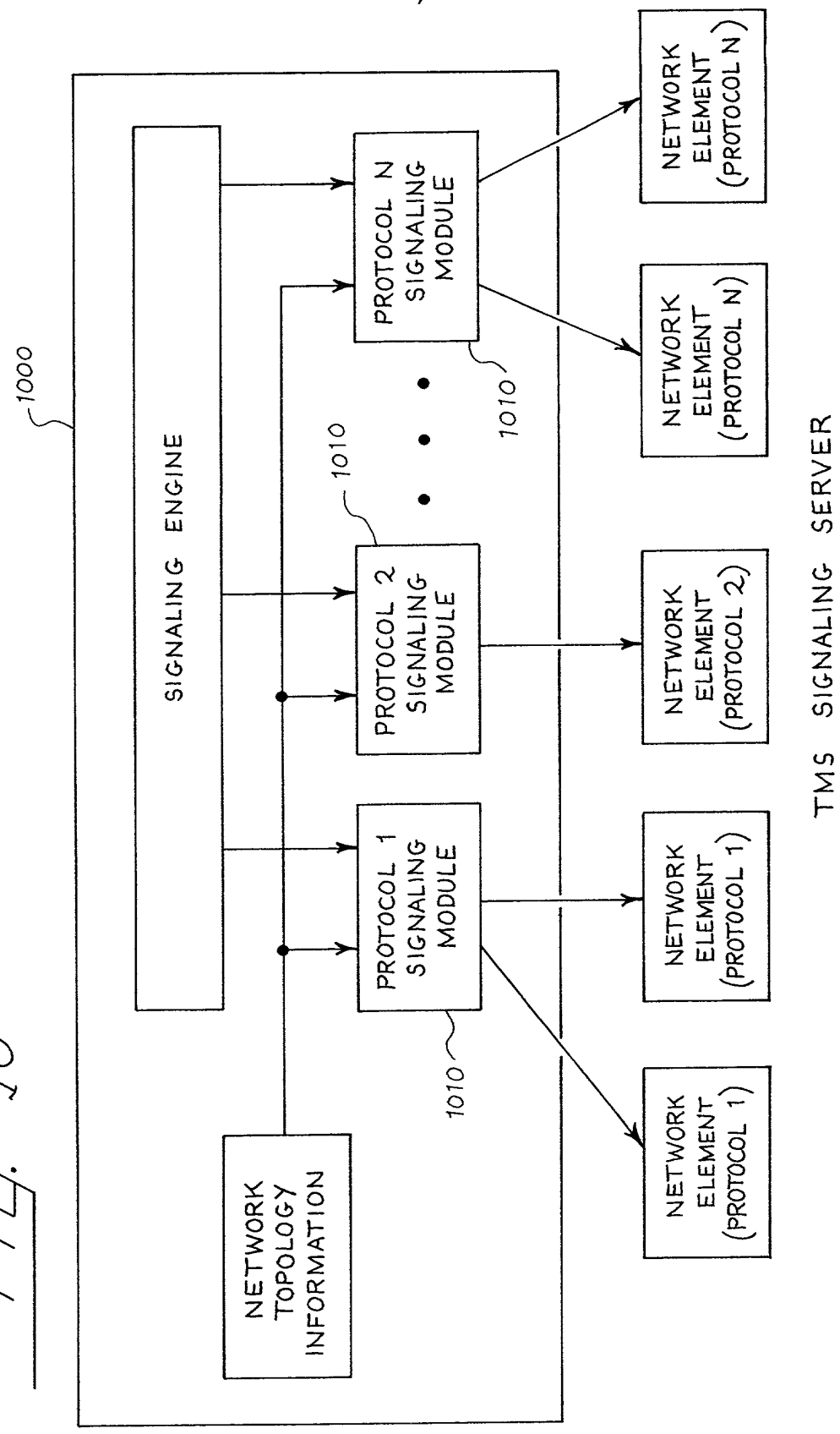


Fig. 10

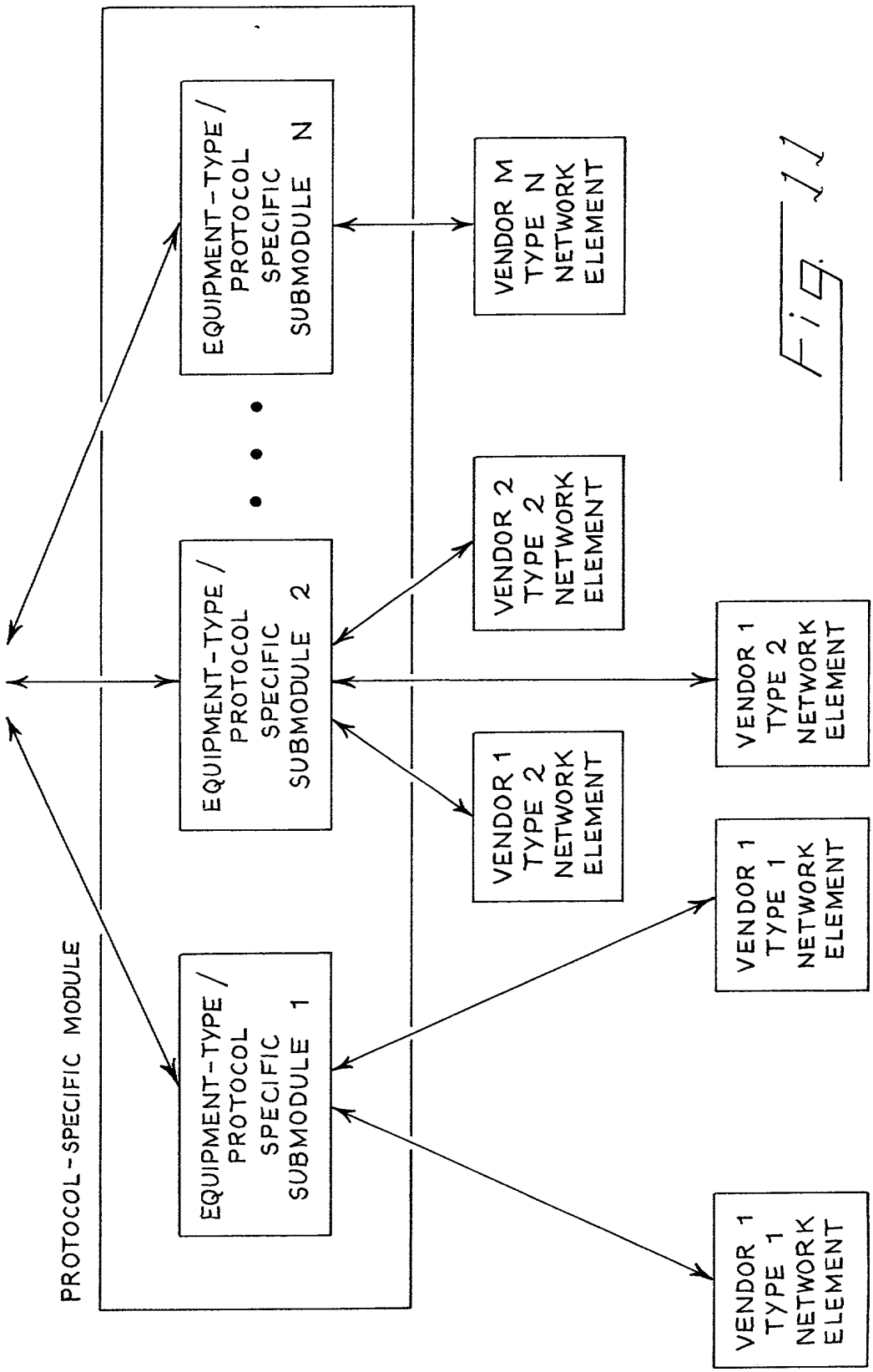


Fig. 11